CLAIMS

What is claimed is:

1.   A method for managing a queue to control loss distribution based on service class, the method comprising the steps of:

5   classifying an incoming packet into one of a plurality of classes, each class having an associated weighting factor;

monitoring a queue size;

determining an overall packet drop probability based on the queue size and a target queue size;

10   calculating a target class drop probability based on the overall packet drop probability and the weighting factor;

comparing the monitored queue size to a selected threshold;

queuing the incoming packet if the monitored queue size is smaller than the selected threshold;

15   making a comparison based on the target class drop probability and a selected comparison value if the monitored queue size is not less than the selected threshold; and

deciding whether to drop the incoming packet based on a result of the comparison.

2.   The method of claim 1, wherein the step of calculating the overall drop probability further comprises calculating an overall drop probability that will drive the actual

20   queue size to the target queue size.

21

3.   The method of claim 2, wherein the step of calculating the overall drop probability comprises decreasing the overall drop probability if the actual queue size is smaller than the target queue size and increasing the overall drop probability if the actual queue size is greater than the target queue size.

5   4.   The method of claim 1, wherein the step of monitoring the queue size comprises sampling the queue size at regular intervals.

5.   The method of claim 1, wherein the weighting factor represents a price per service class.

6.   The method of claim 1, further comprising the step of generating a random number for use as the comparison value.

7.   The method of claim 1, further comprising the step of calculating an inter-drop interval/count as a reciprocal of the target class drop probability.

8.   The method of claim 7, further comprising the step of counting incoming packets from each class to obtain a class count, wherein the step of deciding whether to drop the incoming packet is based on a comparison between the inter-drop interval/count and the class count.

9.   The method of claim 6, further comprising the step of comparing the generated random number to the calculated target class drop probability and queuing the packet if the random number is greater than the target class drop probability and dropping the packet if the random number is less than or equal to the calculated target class drop probability.

10.   A system for managing a queue and controlling loss distribution based on a service class, the system comprising:

22

class determination tools for determining a service class for an incoming packet;

a packet drop controller including means for receiving an actual queue size and a target queue size, means for calculating an overall drop probability, and means for calculating a target class drop probability; and

5   a drop decision module for deciding whether to drop the incoming packet based on a selected drop threshold and for making a comparison based on the target class drop probability and a selected comparison value in order to determine whether to drop or queue the incoming packet.

11.   The system of claim 10, wherein the drop probability calculation tools comprise means for calculating an overall drop probability that will drive the queue size to the target queue size.

12.   The system of claim 11, wherein the drop probability calculation tools comprise means for decreasing the overall drop probability if the actual queue size is smaller than the target queue size and increasing the overall drop probability if the actual queue size is greater than the target queue size.

13.   The system of claim 10, wherein the means for receiving an actual queue size comprise means for sampling the actual queue size at regular intervals.

14.   The system of claim 10, wherein each service class comprises a weighting factor representing a price per service class.

15.   The system of claim 14, wherein the means for calculating the target class drop probability calculates the target class drop probability based on the weighting factor.

16.   The system of claim 10, wherein the drop decision module comprises means for maintaining a count of incoming packets belonging to each class.

17.   The system of claim 16, wherein the packet drop controller comprises means for calculating an inter-drop interval/count, the inter-drop interval/count being a reciprocal of the target class drop probability.

18.   The system of claim 17, wherein the drop decision module comprises means for comparing the count of incoming packets to the inter-drop interval/count and making a drop decision based on the comparison.

19.   The system of claim 10, wherein the drop decision module further comprises a random number generator for generating a random number if the actual queue size is greater than the selected drop threshold.

20.   The system of claim 19, wherein the drop decision module further comprises comparison tools for comparing the generated random number to the calculated target class drop probability and means for queuing the packet if the random number is greater than the target class drop probability and dropping the packet if the random number is less than or equal to the calculated target class drop probability.

21.   An article of manufacture for managing a queue to control loss distribution based on service class, the article of manufacture comprising:

at least one processor readable carrier; and

instructions carried on the at least one carrier;

wherein the instructions are configured to be readable from the at least one carrier by at least one processor and thereby cause the at least one processor to perform the steps of:

24

classifying an incoming packet into one of a plurality of classes, each class having an

associated weighting factor;

monitoring a queue size;

determining an overall packet drop probability based on the queue size and a target queue

5   size;

calculating a target class drop probability based on the overall packet drop probability

and the weighting factor;

making a comparison based on the target class drop probability and a selected value; and

deciding whether to drop the incoming packet based on a result of the comparison.

10   22.   A signal embodied in a carrier wave and representing sequences of instructions

which, when executed by at least one processor, cause the at least one processor to control loss

distribution based on service class by performing the steps of:

classifying an incoming packet into one of a plurality of classes, each class having an

associated weighting factor;

15   monitoring an actual queue size;

determining an overall packet drop probability based on the actual queue size and a target

queue size;

calculating a target class drop probability based on the overall packet drop probability

and the weighting factor;

20   making a comparison based on the target class drop probability and a selected value; and

deciding whether to drop the incoming packet based on a result of the comparison.